SP-1743.1 US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant :	Brandon A. Bartling et al.	Art Unit :	1745
Serial No. :	10/743,585	Examiner :	Gregg Cantelmo
Filed :	December 22, 2003		
For :	Tab System for a Metal-Air Electrochemical Cell		

DECLARATION UNDER 37 CFR §1.132

I, Brandon A. Bartling, do hereby declare and say:

My home address is 685 Ashberry Lane, Avon Lake, Ohio 44012.

I have a Bachelor of Science degree in Chemical Engineering from the University of Nebraska at Lincoln and a Master of Science degree in Chemical Engineering from Case Western Reserve University.

I have worked in the field of electrochemical batteries for over 5 years.

I have been employed by Eveready Battery Company, Inc., for over 5 years, during which I have been a Quality Engineer for about one year and a Technology Engineer for over 5 years.

I am an Applicant in the above-identified patent application.

I declare that, based on an analysis of cells with tab systems that failed and testing of a tab system made with an alternative, stiffer, material, I concluded that conformability of the tab system to the surface of a metal-air cell was desirable for improved adhesion of the tab system to the cell. This was particularly important for those cells that were being made with no added mercury because more internal pressure can develop compared to cells with amalgamated zinc, due to increased internal hydrogen gas generation. I recognized that in order for the tab system to conform better to the cell, it had to be less stiff than the materials I had tried.

I recognized that having oxygen permeability above some minimum level had an additional benefit in a cell with no added mercury. A tab system with at least a minimum oxygen permeability would also provide at least a minimum hydrogen permeability, and having a higher hydrogen permeability would enable hydrogen to escape from the cell at a faster rate, thereby reducing the maximum internal cell pressure and either reducing the likelihood of tab system failure (loss of seal) or extending the time before failure. This could be even more important for cells with no added mercury.

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To obtain a tab system made from a material that would be better than what was currently being used, I contacted the supplier of the current tab system and requested a less stiff, somewhat more permeable material that would be at least as strong. It is my understanding that they replaced the face stock polymer material that had been used (FASSON® PRIMAX® 350/R143/50#SCK) with another material that was available (FASSON® 3 Mil Matte White BOPP TC/R143/50#SCK), and the resultant material was that which was used for tab systems according to the invention as disclosed in the Examples of the above-identified application.

I later compared the properties of the tab system of the invention with tab systems that were being used by two other metal-air cell manufacturers, Rayovac and Duracell (neither of which I believed to be selling metal-air cells with no added mercury). The tab system on the Rayovac cells had a biaxially oriented polypropylene base material layer covered by a plastic film, and the tab system on Duracell cells was an elongated tab with a stiff polymeric handle layer and a resilient foam layer between the handle layer and the cell. The Rayovac tabs had a loss stiffness value of approximately 4,500 N/m and peel strengths of 3.7 to 6.2 psi, and the Duracell tabs had a loss stiffness value of approximately 102,000 N/m including the foam layer and approximately 66,000 N/m without the foam layer and peel strengths of 4.6 to 6.4 psi. Because tabs taken from the Rayovac and Duracell cells are too small to be tested directly for oxygen permeability, the oxygen permeability was calculated from other test results according to the method described in the attached Exhibit. Tabs from the Rayovac cells were found to have oxygen permeability values of 5 and 8 $(cm^3 \times m \times mmHg)/(m^2 \times day)$, respectively, based on testing on PR 70 (AC10) and PR48 (AC13) size cells, respectively. Tabs from the Duracell cells were found to have oxygen permeability values of 74 and 121 $(cm^3 \times m \times mmHg)/(m^2 \times day)$, respectively, based on testing on AC10 and AC13 size cells, respectively.

I had testing done to confirm the materials used in the Rayovac tabs. The tests showed the facestock to be polypropylene (by Fourier Transform Infra Red spectroscopy (FTIR)) with biaxial orientation (by heat shrink test), with an overlaminate of polypropylene (by FTIR), a synthetic hydrocarbon tackifying resin adhesive between the facestock and overlaminate (by FTIR), and an acrylic adhesive (by FTIR) on the surface of the polypropylene facestock facing the cell.

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I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patents issuing thereon.

Signed:

3-5-07
Date

Brandon A. Bartling